Computer Final Revision



3rd.Preparatoury - 1st.Term

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Chapter one: Problem Solving

Problem definition:

Problem is a situation that requires a solution or an objective you want to achieve through following consecutive steps sequentially.

Problem solving:

Problem Solving is the steps, activities, and processes to be done to reach an output or objective.

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Problem solving stages:

(1) **Problem Definition**

Identification of required outputs, available inputs and, arithmetic and logical operations to be executed.

(2) **Algorithm Preparation**

Algorithm is one of the methods used to solve a problem through logically arranged procedures (Flowchart).

(3) **Program Design**

we have to translate this flowchart into one of the programming language

(4) **Program Testing**

We cannot detect errors unless we begin entering data to the program with previously known results; and compare the results of the current.

(5) Documentation

is done to have the program documented to go back for feedback and correction. This documentation is beneficial when more than one person participates in writing or modifying the program.

Flowchart

It is a diagram that uses standard graphical symbols to illustrate the sequence of steps required for solving a problem or specific question.

Some advantages of Flowcharts:

- Facilitating the reading and understanding of the problem and illustrating to the programmer what must be done.
- Useful to explain the program to others
- helping in documenting the program in better manner, especially if the program is complicated

The most commonly used symbols as shown in the table:

Significance	Symbol
Terminal	(oval)
(input & output)	(parallelogram)
(process)	(rectangle)
(Decision)	(diamond)
(Flow lines)	↓ → ↑ ←



To construct a flowchart, we should consider the following:

1. The flowchart should start with the Start symbol and end with the End symbol.
2. A,B,C are variable names .The variable refers to a memory storage that holds a value.
3. Equation: C =A+B, indicates the sum of the value of A, to the value of B, and stores the result in C.
4. Entering values in A and B is done by using the term "Enter", inside a parallelogram, like "Read" or "Input".
5. The sum equation is written inside the rectangle, as it represents an arithmetic operation.
6. The output is expressed with a parallelogram using the term "Output", we can also use another term like "Print" or "output".

Note that flow line ↓ shows the order of an Algorithm.

Chapter Two: Introduction to Visual Basic.net

The language of visual Basic .net:

It is one of the high level programming languages and designed to be easy to learn as its commands and instructions use English language vocabulary and it can be used in many applications such as:

1- Windows applications
2- Web applications
3- Mobile Application

Programming and computer memory:

Commands and instructions which are written in Visual Basic.net enable you to create objects in computer memory and every object has:

1- **Properties** such as (size-colour- font) of the text written on the program interface.
2- **Events** such as click on a command button.
3- **Procedures**, each one contains commands and instructions which are carried out when calling this procedure.

So, the Visual Basic.net is considered:

Object oriented as its programs work through objects in computer Memory.

Event Driven as commands and instructions are carried out as soon as certain event occurs.

The language of visual basic .net and framework.Net:

The Framework.Net provides the following:

* **Libraries** through which we create the objects.
* **Runtime** environment (called Runtime) in computer memory where Applications produced by the language of Visual Basic.net language work in.
* **Compilers** which compile commands and instructions written in Programming language into machine code which the Computer deals with.

Visual Basic .Net IDE:

The programmer of Visual Basic.net needs Integrated Development Environment (IDE) which provides tools and merits to the programmer that help him create applications (windows – mobile – web…..). Visual Studio represents IDE.

Form:

The form is the interface which the user deals with through different controls such as Button, Textbox, label……etc.

Form window before putting controls Form window after putting controls

Toolbox Window:

It contains tools of controls which can be put on the Form and can be shown in categories in the following Figure



Some of these categories include:

1. Common Controls
2. Menus & Toolbars
3. Properties Window

Each tool of the above Common Controls has a group of properties which can be adjusted through "Properties Window" as shown in this Figure:

Solution Explorer

There is a list of folders and files of the projects in this part as shown in this Figure:

Chapter Three: Controls

1. Form

The Form has many properties which share in defining the form of program screen we want to create. Here **are some properties of the Form:**

N	Property Name	Function
1	Name	Name of Form used in Code Window
2	Text	The appeared Text on the title bar of the Window
3	Backcolor	The background color of the Form.
4	Right to Left	The direction of Controls on the form Window From Right to Left.
5	Right to Left layout	The layout of Controls on the Form from right to left
6	MinimizeBox	It controls the appearance or disappearance of MinimizeBox of Form Window
7	MaximizeBox	It controls the appearance or disappearance of MaximizeBox of Form Window
8	ControlBox	It controls the appearance or disappearance of ControlBox of Form Window
9	FormBorderStyle	The Border style of Form Window
10	WindowState	It defines the Window State of the Form (Maximizing, Minimizing or normal)

- There are common properties among different Controls such as (Name-Text – Forecolor – Backcolor - Right To Left…….etc.)
- There are properties of the form, if they are set, they are applied to Controls which are placed on this Form such as font and ForeColor properties
- When you set some properties, the effect of setting appears directly on the Form in design mode of the program
- There are some properties which their effect doesn't appear on Controls until you set some other properties , for example the Right to Left Layout property doesn't work unless the value Right to Left equals Yes
- The default value of the property (Text) and the property (Name) is the same and it is (Form1)
- There are some properties which their effect doesn't appear on the Form or Controls until you run the program
- The other Controls may have the same properties mentioned above, so they won't be repeated again when we studying these other controls once more

2. Button

It is one of Controls which can be placed on the Form. When you click it, it does a certain task.

Some distinctive properties of Command Button:

N	Property Name	Function
1	Location	The location of placing Button on the Form.
2	Size	Defining the height and width of Button on the Form.
3	Text	The appeared Text on the Button
4	BackColor	Choosing the backColor of the Button.



5	Font	Defining (shape ,size and style) of the Text font appeared on the Button.
6	ForeColor	Choosing the ForeColor to the appeared Text on the Button

3. Label

It is a tool used in showing a Text on the Form Window which can't be changed during program Runtime.

Some distinctive properties of the Label:

N	Property Name	Function
1	AutoSize	The Size of the Label is defined automatically according to the written Text if the Value of property equals true.
2	BorderStyle	Choosing the Border Style of the Label

4. TextBox

It is a tool used to insert (input) data from the user during program run time.

Some distinctive properties of the Textbox:

N	Property Name	Function
1	Maxlength	It defines the maximum number of letters which can be inserted in the TextBox
2	PasswordChar	It defines a symbol used instead of written text in case we have a password.
3	Multiline	Allows multiple lines within the text box control tool.

5-ListBox

It shows a list of items.

Some distinctive properties of ListBox:

N	Property Name	Function
1	Items	A group of items shown in the ListBox
2	Sorted	It defines whether the elements in the list are sorted or not.
3	selectionMode	It defines whether it is possible to choose one item or more shown in the ListBox.

6. ComboBox

A ComboBox control displays a drop-down list from which one item can be selected.

Some distinctive properties of the ComboBox:

N	Property Name	Function
1	Items	A group of items which are shown in comboBox.
2	AutoCompleteSource	It is a source of suggested items to select from.
3	AutoCompleteMode	It defines the method of list completing process.

7. GroupBox

Is used to group other controls of same function together on the Form window.

Text – Forecolor - RightToLeft

8. RadioButton

The program user selects one alternative only.

Some distinctive properties of the RadioButton:

N	Property Name	Function
1	Checked	It shows whether RadioButton has been chosen or not.
2	Text	It is the Text shown on RadioButton

9. CheckBox

It is used for placing some alternatives to enable the user to select one CheckBox or more as shown in Figure:



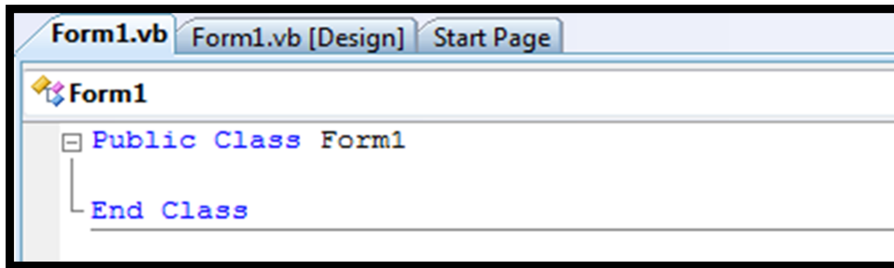
Chapter Four: Code Window

Visual Basic.NET language provides a window through which we can write instructions and codes of the program called (code window)

<u>To open the (Code Window) of (Form1) perform the following:</u>

1. Make sure that the window Form is active
2. From the keyboard press (F7)

<u>The Code window is displayed as shown in the following figure:</u>



<u>Code Window</u>

1. Name of the file where codes are saved
2. Name of the file where the Form window interface is saved
3. The declaration of Class; its name is (Form1)
4. Space between two lines; to type codes for the Class (Form1)
5. The end of the class (form 1)

<u>Event Handler</u>

It's a procedure which contains a code that is carried out when a corresponding event occurs.

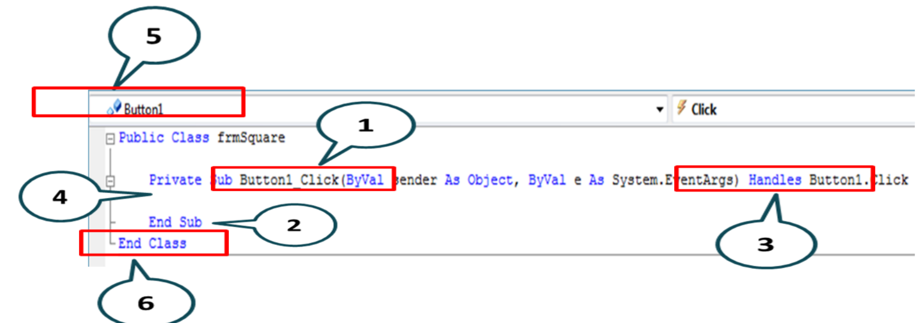
<u>To create Event Handler do the following steps:</u>

In the (Solution Explorer) window, right click the file (Form1.vb) and, select (View Code) from the context menu as shown in this figure:

(1) A drop-down menu of (Class Names) that displays the names of controls on the form.

(2) A drop-down menu of (Method Names) or events; associated with the item selected from the (Class Names) menu.

<u>Event Handler</u>



(1) The procedure name composed of (object name, event name).
(2) End of procedure line.
(3)) What causes the call of the procedure (event occurrence) .
(4) Between the two lines shown; the code that will be executed on calling the procedure is written after the occurrence of the (Event).
(5) The declaration of the class line (frmSquare).
(6) The end of (class) line.

<u>Setting the (Properties) programmatically</u>

1. In chapter 3, we have already set the properties through properties window.
2. You can adjust the properties using the following syntax:
3. CONTROLNAME. PROPERTY = VALUE

The control or the object name

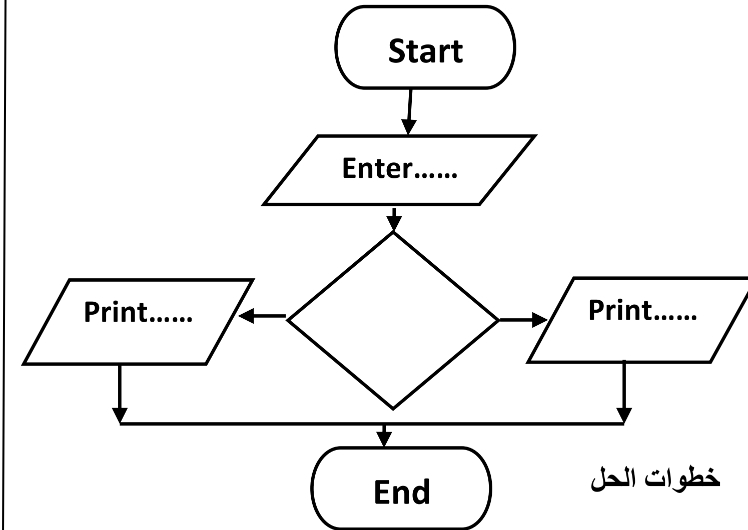
The property

The value

الحالة الاولى :- فى حالة السؤال عن

(الاكبر- الاصغر- يساوى – ناجح – راسب- زوجى- فردى مقارنة بين شخصين) يتم استخدام هذا الشكل من خرائط التدفق

أكبر من > - أصغرمن < - يساوى = - اكبرمن اويساوى >= - أصغرمن او يساوى <= - لايساوى < >



خطوات الحل

١-بداية

٢- ادخال ....

٣- اذاكان .... أذن

٣-١ طباعة.............................. واذهب الى النهاية

٤- طباعة ....

٥- نهاية

خرائط التفرع

الحالة الثانية : - فى حالة السؤال عن

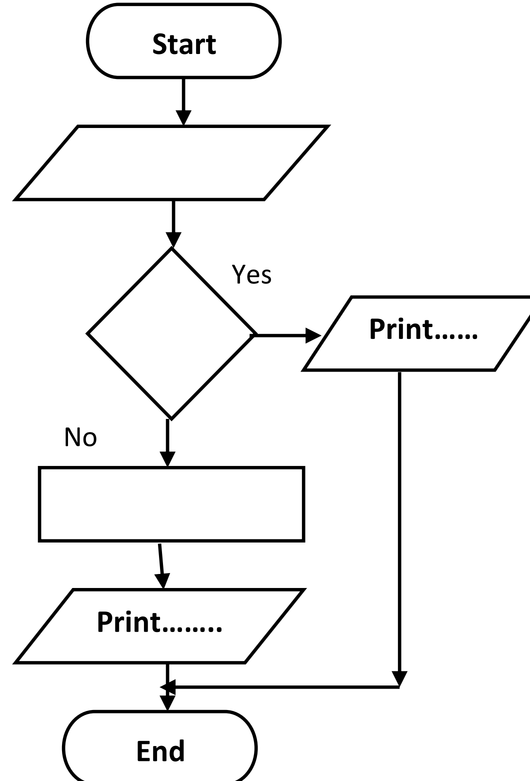
١-قسمة عددين (العدد الثانى – المقسوم عليه – صفرا- أطبع غير معروف) **R=N1/ N2**

يتم كتابة الشرط **N2=0** داخل المعين

٢- مساحة (دائرة – مربع) ونصف القطر سالبا

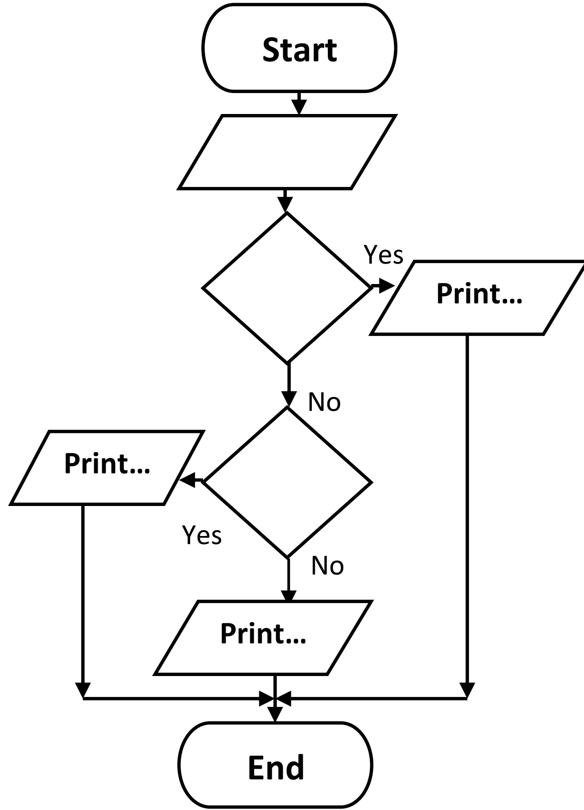
R سالبة **A=3.14*R*R**

يتم كتابة الشرط **R < 0** داخل المعين



الحالة الثانية : - فى حالة السؤال عن

درجات الحرارة - توقيت المواد الدراسية – مقارنة من حيث الاكبر الاصغر متساويان أو نفس العمر



D<0	D> 0	D=0
أصغرمن الصفر -	كبرمن الصفر -	تساوى الصفر
T=5	T=4	T= 3
علوم	دراسات	كمبيوتر

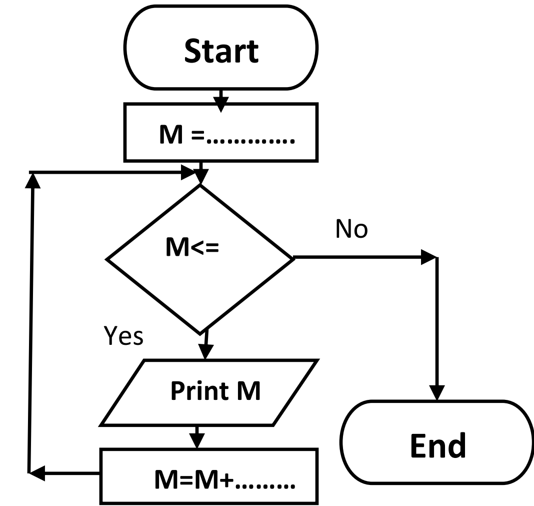
خرائط التكرار

الحالة الاولى :- فى حالة السؤال عن

M

طباعة الاعداد من ....الى ....

يجب التركيز على القيم التالية
1- قيمة البداية
2- قيمة النهاية
3- مقدار الزيادة

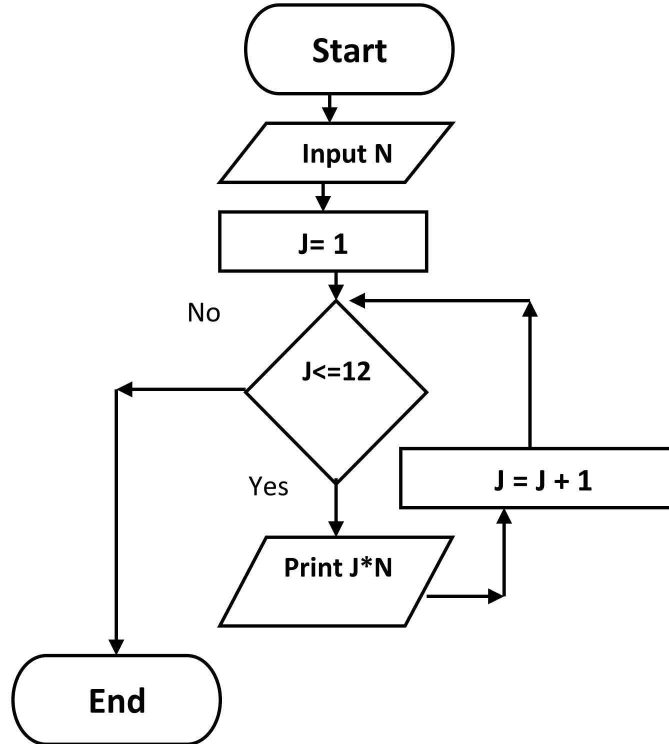


اسئلة على الخريطة
1- قيمة البداية هى ....
2- قيمة النهاية هى ....
3- مقدار الزيادة ....
4- عددمرات التكرار ....
5- القيمة بعد انتهاء التكرار ......
أو القيمة عندما يصبح الشرط غير صحيح ......

J

الحالة الثانية :- فى حالة السؤال عن

طباعة حاصل ضرب الاعداد أو
جدول ضرب الاعداد



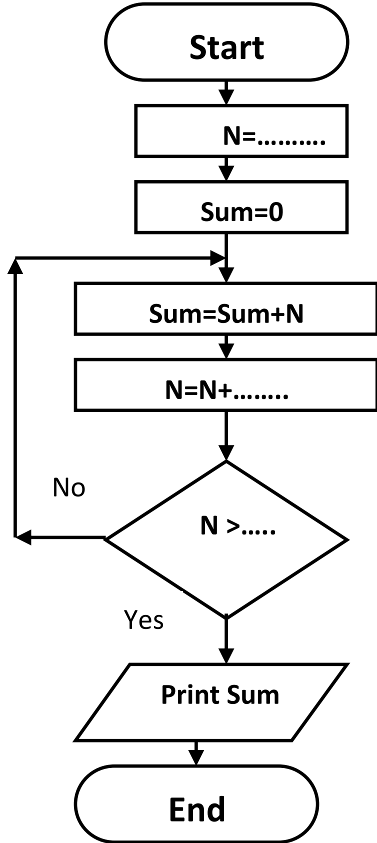
قيم J هى ناتج ضرب الاعداد من 1الى 12

قيمة Jبعد انتهاء التكرار 13

الحالة الثالثة :- فى حالة السؤال عن

Sum

طباعة مجموع الاعداد من ....الى ....



للحصول على قيمة Sum

يتم معرفة عدد مرات التكرار واجراء عملية الجمع عليها